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09/939,330	08/24/2001	Alfred Kersch	L&L-10078	3872

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/939,330
Filing Date: August 24, 2001
Appellant(s): KERSCH ET AL.

Yonghong Chen
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 2, 2005 appealing from the Office action mailed March 23, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaartstra (US 6,159,855) in view of Ahmed (US 4,468,283).

Vaartstra teaches a process of forming ferroelectric or perovskite films by chemical vapor deposition (column 7, lines 45-55). Water vapor may be used as a reactant gas (column 11, lines 5-10), which reads on applicant's "auxiliary gas". Water has a dipole moment and, according to the applicant's specification on page 10, lines 15-20, has the property required by claim 1. The water vapor is fed by an external supply source that is a storage container (figure 1, ref. 19). The carrier gases, precursor gases, and water vapor are all fed into the reaction chamber through a showerhead (column 12, lines 20-26). The substrate is mounted opposite the showerhead and a pump is used to exhaust the reaction chamber (figure 1, ref. 42, 46). Vaartstra fails to explicitly teach providing a connecting line directly connecting the further gas outlet opening to one of the inlet openings, with a valve in the connecting line for controlling gas flow.

However, Ahmed teaches an upgrade for CVD systems (abstract) that has such a configuration (figure 1, column 7, lines 20-30; column 6, lines 1-5). The benefit of using such a configuration is so that the process achieves more uniform reaction rates (column 5, lines 30-50). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the upgrade taught by Ahmen, and the corresponding configuration, in the process taught by Vaartstra. By doing so, one would reap the benefits of uniform reaction rates.

(10) Response to Argument

Applicant argues that because Ahmed, the secondary reference, fails to teach a valve in the connecting line, that the combination of references would fail to make obvious the limitation of having a valve in the connecting line. This is not found convincing. Vaartstra is the primary reference. It is explicitly taught to use valves on every feed line of the reactor in order to control the amount of gas being flowed into the reactor. This allows more control of the process, thus resulting in more uniform films and the ability to control specific parameters of the film. Ahmed teaches that using a recycle stream produces more uniform reactant rates (column 5, lines 35-40). Thus, it would have been obvious to use a recycle stream in the process taught by Vaartstra. Although, the recycle stream in Ahmed does not require a valve, because the primary reference teaches that all feed lines into the reactor require a valve, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a valve. By doing so, one preserves the explicit teaching of the primary reference of controlling the flow of every constituent being fed into the reactor, thus preserving controllability and uniformity.

Applicant alleges that by Ahmed not requiring a valve, it teaches away from a valve. This allegation stems from the assumption that a valve would slow down the velocity of the stream and that Ahmed desires a large velocity. This is not true. Ahmed does teach that higher velocities achieve higher growth rates. However, this is achieved by the existence of the recycle stream itself (column 5, lines 5-32). Recycling the stream, and thus having more gas being fed through the same diameter pipe,

increases the velocity. Therefore, including the recycle stream in the process taught by Vaarstra would increase the velocity of the flow, with or without a valve (except for the one instance where the valve is fully closed), since it would increase the flow rate without increasing the diameter of the feed pipe. Additionally, using a valve does not necessitate a slower velocity, as alleged by the applicant. If the flow rate is maintained (by pressure), the smaller cross sectional area of the pipe that the valve causes actually increases the velocity of the flow.

Even if the applicant's arguments were true (which as shown above the examiner does not agree with), at best they only show that the two references teach a trade-off between growth rate and controllability. Both are beneficial. Higher growth rates can produce more products, but uniformity and quality may suffer. Controllability allows for more precision and more quality, but is generally a slower process. Depending on the desired output, one of ordinary skill in the art would have the ability, through routine experimentation, to optimize the process. One extreme being no valve, the other being a valve in a fully closed position, and the middle being a valve fully or partially opened. To use any of the above configurations would have been obvious having the knowledge charged to a design engineer.

Applicant has argued against the above arguments by alleging that Bernoulli's equation only is applicable to specific types of valves and that by inserting any type of valve into the line, the throttling would occur. This is not found convincing. Neither the claims, nor the references, are limited to the type of valve used. Thus, one that fits Bernoulli's model would be applicable. Additionally, using a valve that has the least

impedance when in the fully open position would have been obvious in order to preserve the flow characteristics of the pipe itself.

Lastly, it is noted that the claims do not require flowing any material through the connecting line or the valve being in any position. The claims only require the presence of the connecting line and valve. By having the valve in a fully closed position, this is the functional equivalent of the process taught by Vaartstra. By having the valve fully opened, this is the functional equivalent of there being no valve at all (as long as the valve chosen has a relatively low impedance in this position, which many do). Thus, the mere presence of a valve in a method claim should not be considered a patentable distinction. Valves are widely known. To control flow with a valve (which is more than the claims require) is also widely known.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

EBF

Conferees:

TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER

Tim Meeks

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